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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,303	01/27/2006	David H. Tracy	BCR-012.1P US	1905
22840 7590 07/10/2008 GE HEALTHCARE BIO-SCIENCES CORP. PATENT DEPARTMENT 800 CENTENNIAL AVENUE PISCATAWAY, NJ 08855				
EXAMINER SLOMSKI, REBECCA				
ART UNIT 2877		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/566,303

**Applicant(s)**

TRACY ET AL.

**Examiner**

REBECCA C. SLOMSKI

**Art Unit**

2877

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13, 15, 17-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15, 17-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

Claim 11 is objected to because of the following informalities: line 2 discloses "the central axis of said optics". For clarification purposes, the examiner suggests amending to specify "source optics". Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. With respect to claim 1, the limitation within (f) "the reflective sensor is positioned at the optical vertex of the angular range of said light source assembly" is undefined. An optical vertex applies to a light source and a lens, and is undefined in terms of the optical vertex of the angular range. For the purposes of examination, the examiner will understand the limitation to mean that the optical vertex remains the same for the light source across the entire angular range and at this point, the reflective sensor is

positioned. However, this is not a clear limitation of the claim and therefore clarification is required.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3-7, 13, 15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biofons Ltd WO 2005/050181 in view of Dickopf et al. U.S. Patent # 6,752,963.

2. With respect to claim 1, Biofons Ltd discloses a device for surface Plasmon resonance comprising:

- A support frame (Figure 3, rotating arrangement 11)
- A target area attached to said support frame configured to receive and securely hold a flow cell comprising a reflective sensor in a substantially stationary position (Figure 3, reflective sensor 10, rotating arrangement 11, Page 6, l 3-4, Page 6, l 36- Page 7, l 5)
- A light source assembly comprising a light source, which light source assembly is oriented to project a beam of light onto said reflective sensor and which light source assembly is rotatably attached to said support frame so as to permit alteration of the orientation of said light source with respect to the position of said sensor (Figure 2 and 3, source 2, Page 4, L 21-23)

- Means for altering the orientation of said light source assembly over an angular range (Page 6, L 25-28, inherent that something is doing the range altering)
- A detector assembly attached to said support frame oriented to receive light reflected from said sensor, wherein said reflective sensor is positioned at the optical vertex of the angular range of said light source assembly such that said beam of light stays fixed at one location on said reflective sensor as the orientation of said light source assembly is altered over said angular range (Figure 3, detector 7, Figure 2, Page 8, L 14-17, as angle is changed, light is always directed at longitudinal midline 9)
- Wherein said detector assembly comprises a detector comprising a detector sensing element and a lens assembly for focusing a reflected image of said sensor onto said detector sensing element which lens assembly is positioned between said detector and said target area (Figure 3, detector 7, mirror 8, Page 8, l 3-7, lens assembly = mirror, Page 4, l 15-18)

However, Biofons Ltd fails to disclose source optics oriented to project a collimated beam of light onto the reflective sensor, a means for recording the angular change in the orientation of the light source assembly, and a lens assembly comprising a sensor imaging double telecentric lens assembly.

Dickopf discloses an SPR sensor system comprising:

- A light source assembly comprising a light source and source optics for focusing light emitted from said light source which light source assembly is oriented to project a collimated beam of light onto said reflective sensor (Figure 8, source 400, telescope assembly 420 + 425, Col.10, L 29-34)
- A detector comprising a detector sensing element and a lens assembly for focusing a reflected image of said sensor onto said detector sensing element, which lens assembly is positioned between said detector and target area and comprises a sensor imaging telecentric lens assembly (Figure 8, detector 500, telescope assembly 440 + 460, Col.10, L 37-43)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the source optics and telecentric lens assembly of Dickopf in the SPR system of Biofons Ltd since image distortions would be avoided. (Dickopf, Col.10, L 30-32) Additionally, it would have been obvious to employ a double telecentric lens assembly, rather than a single telecentric lens assembly of Dickopf, since the increased components would prevent defocused images on either input or output ends, and allow the focused image to be independent of geometrical distances. (Olszak et al., U.S. Publication 2005/0259327, P.0069)

Additionally, it would have been obvious to include a means for recording the angular change in the orientation of the light source assembly in the SPR system of Biofons Ltd since this would be necessary for completing calculations to obtain results from the measurement data.

3. With respect to claims 3-6 and 13, Biofons Ltd discloses all of the limitations as applied to claim 1 above. In addition, Biofons Ltd discloses changing the angular orientation of the light source, detector and prism, however fails to specifically disclose the means for doing so. However, the claimed adjusting means would have been known in the art. It would have been obvious to modify Biofons Ltd with the known adjusting means as claimed for different intended uses.
4. With respect to claim 7, Biofons Ltd discloses all of the limitations as applied to claim 1 above. In addition, Biofons Ltd discloses varying an angle of incidence however fails to disclose a built-in indexing mark providing a reference point at the start of each optical analysis. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a start point in order to make calculations easier and the measurement more accurate.
5. With respect to claim 15, Biofons Ltd discloses all of the limitations as applied to claims and 13 above. In addition, Biofons Ltd discloses the lens assembly comprises a mirror (Figure 3, mirror 8). However, Biofons Ltd fails to disclose specifically including one or more of the following: refractive elements, an aperture stop, a corrector plate, and a detector window.

Dickopf discloses achromatic lens, objective lens, a slit and a monochromator (Figure 8, monochromator 410, slit 430, achromatic lens 440, 460, objective lens 450).

It would have been obvious to include the optical elements of Dickopf and other additional optical elements in the SPR system of Biofons Ltd since adding optical elements is well known to the art and would facilitate directing the light towards the sensor as well as controlling the size and focus.

6. With respect to claim 17, Biofons Ltd discloses all of the limitations as applied to claim 15 above. However, Biofons Ltd fails to disclose a passive cold finger positioned between a detector and corrector plate. It would have been obvious to include a passive cold finger in Biofons Ltd since surface plasmon resonance depends on maintained temperature of the sample and the cold finger would enable different characteristics of the sample to be measured.
7. With respect to claim 18, Biofons Ltd discloses all of the limitations as applied to claim 15 above. However, Biofons Ltd fails to disclose the orientation of the detector and elements are effective to match the dimensions of a reflected image of said sensor to the dimensions of the detector sensing element.

Dickopf discloses detector assembly and refractive elements are effective to match the dimensions of a reflected image of said sensor to the dimensions of the detector sensing elements (Col.10, L 39-45)

It would have been obvious to one of ordinary skill in the art at the time of the invention to orient the detector and elements as in Dickopf for the sensor of Biofons Ltd since a



one-to-one sensing correspondence provides for more details and less distortion of the measurement image.

8. With respect to claim 19, Biofons Ltd discloses all of the limitations as applied to claim 15 above. In addition, Biofons Ltd discloses detector and lens assembly may be independently adjusted with respect to the position of the sensor (Page 8, l 10-12, not mechanically fixed together inherent requires them to be independently adjusted)
9. With respect to claim 20, Biofons Ltd discloses all of the limitations as applied to claim 15 above. However, Biofons Ltd fails to disclose a CCD camera and CCD chip.

Dickopf discloses the detector is a CCD camera and said sensing element is a CCD chip (Col.10, L 40-43)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a CCD detector and CCD chip rather than the silicon detector of Biofons Ltd since the CCD detector will allow for a one to one correspondence of the image data and more accurate measurement.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biofons Ltd in view of Dickopf as applied to claim 1 above, and further in view of Salamon et al. U.S. Patent # 6,421,128.

10. With respect to claim 2, Biofons Ltd discloses a prism based surface Plasmon resonance sensor (Abstract). However Biofons Ltd fails to disclose reflective sensor is a grating

coupled surface Plasmon resonance sensor. Salamon discloses a prism and a grating are two art equivalent structural elements for a surface Plasmon sensor. It would have been obvious to one of ordinary skill in the art to substitute the prism SPR sensor with a grating based SPR sensor since this would allow measurements of a greater variety of samples.

Claims **8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Biofons Ltd in view of Dickopf as applied to claim 1 above, and further in view of Van Wiggeren et al. U.S. Publication 2007/0046943.

11. With respect to claims **8-10**, Biofons Ltd discloses using a laser for the SPR system, but fails to disclose the light source is a light emitting diode with a narrow band of wavelengths encapsulated in optically flat plastic material. Van Wiggeren discloses a laser and a light emitting diode are art recognized equivalents at the time of the invention (P.0016). It would have been obvious to substitute the laser of Biofons Ltd for a narrow banded LED of Van Wiggeren that minimizes optical distortion in order to provide more alternatives for wavelengths to different samples and provide the least distorted beam possible.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biofons Ltd in view of Dickopf as applied to claim 1 above, and further in view of Schwerdt U.S. Patent # 3,214,596.

12. With respect to claims 11-12, Biofons Ltd fails to disclose offsetting the light source from the central axis of the source optics. Schwerdt discloses tilting the light path and optical element relative to each other. (Figure 1, tilt of lens 49) It would have been obvious to tilt the light source with respect to the lens in any optical system in order to minimize reflections and stray light that may cause errors in measurement (Col.3, L 30-33).

Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biofons Ltd in view of Dickopf as applied to claim 1 above, and further in view of Elkind et al. U.S. Patent #6,326,612.

13. With respect to claim 21, Biofons Ltd in view of Dickopf discloses all of the limitations as applied to claim 1 above. In addition, Biofons Ltd discloses a flow cell (Figure 4, location of 13 and 14 for sample). However, Biofons Ltd does not explicitly disclose a flow cell having a reservoir, one or more pumps, and waste receptacle as claimed. Elkind discloses the claimed flow cell (fig 5). It would have been obvious to modify Johansen with the flow cell system taught by Elkind to make the system more accurate.
14. With respect to claim 22, Biofons Ltd in view of Dickopf and further in view of Elkind discloses all of the limitations as applied to claims 1 and 21 above. However, Biofons

Ltd, Dickopf and Elkind do not disclose a bubble blast means. However, it would have been obvious a design choice to modify Elkind with the claimed bubble blast means to facilitate the measurement.

15. With respect to claims **23, 24** and **26**, Biofons Ltd in view of Dickopf and further in view of Elkind disclose all of the limitations as applied to claims 1 and 21 above. In addition, Elkind discloses the claimed thermal 164 (fig 5) chamber 152 (fig 5), the claimed heat exchanger 172 (fig 5) and the claimed active 164 (fig 5) heating. It would have been obvious to include the thermal chamber of Elkind in the SPR sensor of Biofons Ltd since it is well understood in the art that surface plasmon resonance is dependent upon temperature of sample.
16. With respect to claim **25**, Biofons Ltd in view of Dickopf and further in view of Elkind discloses all of the limitations as applied to claims 1 and 21-24 above. However, Biofons Ltd, Dickopf and Elkind do not disclose segmented passive heat exchanger. However, it would have been obvious to modify Elkind with different types of heat elements for different purposes.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to REBECCA C. SLOMSKI whose telephone number is (571)272-9787. The examiner can normally be reached on Monday through Thursday, 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. G. Lauchman/  
Primary Examiner, Art Unit 2877

Rebecca C. Slomski  
Patent Examiner

rcs